

[0105] When the parking management system 100 determines the location of the causal POI 800, the parking management system 100 can send one or more notifications, messages, or alerts to user client devices in the vicinity of the causal POI 800 to alert such users to list their parking spaces using the parking management system 100. The parking management system 100 can send notifications, messages, or alerts to client devices of users who have previously listed their parking spaces using the parking management system 100. The parking management system 100 can also send notifications, messages, or alerts to user client devices along the request trajectory 802 or along a route leading to the causal POI 800.

[0106] FIG. 9 illustrates that a computer-implemented method 900 of managing parking reservations over the communications network 118 can include receiving, in one or more databases 108 stored in one or more memory units 204, positional data 602 concerning a listing location 310. The positional data 602 or address of the listing location 310 can be transmitted by a listing client device 102 in step 902. The positional data 602 or address of the listing location 310 can also be transmitted by a parking sensor 106 in step 904. When the listing client device 102 or parking sensor 106 transmits an address, the application servers 110 can query a map or GIS database for the positional coordinates of the address in step 906. The application servers 110 can interact with the map or GIS database through a map API such as the Google Maps® API.

[0107] The method 900 can also include establishing, using one or more processors 202, a radius boundary 702 based on the positional data 602 stored in the one or more databases 108 in step 908. The method 900 can also include filtering, using the one or more processors 202, the one or more databases 108 using the radius boundary 702 to determine the listing count 616 representing an amount of parking spaces listed and the reservation count 618 representing the amount of parking spaces reserved within a preset time period 704 in step 910.

[0108] The method 900 can also include calculating, using the one or more processors 108, a transaction rate 706 using the listing count 616, the reservation count 618, and the preset time period 704 and storing the transaction rate 706 in the one or more databases 108 in step 912. The method 900 can also include calculating an average listing price 718 in step 914. The method 900 can also include calculating a listing multiplier 708 in step 916. The method 900 can include determining, using the one or more processors 108, a recommended listing price 700 based on the average listing price 718 and the listing multiplier 708. The method 900 can include transmitting the recommended listing price 700 to the listing client device 102 over the communications network 118 in step 920.

[0109] The method 900 can also include the application servers 110 receiving a status update 420 concerning the departure of a booking vehicle 422 from a reserved parking space 414. For example, a booking client device 104 can transmit the status update 420 in step 922. The method 900 can include determining a real-time position 724 of the booking client device 104 in response to receiving the status update 420 in step 924. The method 900 can also include querying a parking sensor 106 in the vicinity of the reserved parking space 414 in response to the status update to confirm an occupancy status 608 of the reserved parking space 414 in step 926. The method 900 can also include calculating a

penalty rate 726 using a penalty multiplier 728 when the system determines the booking vehicle 422 has overstayed the end of the reservation period 418 in step 928.

[0110] The system and methods described herein provides an improvement in the way parking data or information is managed and stored in a cloud managed database. In addition, by calculating a recommended listing price 700 based on a transaction rate 706 corresponding to the rate at which parking listings are added and reservation requests are received, the system provides an improvement in the field of parking management beyond recommending prices based on static inventory levels.

[0111] A number of variations have been described. Nevertheless, it will be understood by one of ordinary skill in the art that various modifications may be made without departing from the spirit and scope of the variations. In addition, the flowcharts or logic flows depicted in the figures do not require the particular order shown, or sequential order, to achieve desirable results. In addition, other steps or operations may be provided, or steps or operations may be eliminated, from the described flows, and other components may be added to, or removed from, the described systems. Accordingly, other variations are within the scope of the following claims.

[0112] It will be understood by one of ordinary skill in the art that the various methods disclosed herein may be embodied in a non-transitory readable medium, machine-readable medium, and/or a machine accessible medium comprising instructions compatible, readable, and/or executable by a processor or processing unit of a machine, device, or computing device. The structures and modules in the figures may be shown as distinct and communicating with only a few specific structures and not others. The structures may be merged with each other, may perform overlapping functions, and may communicate with other structures not shown to be connected in the figures. Accordingly, the specification and/or drawings may be regarded in an illustrative rather than a restrictive sense.

What is claimed is:

1. A system, comprising:

a non-transitory memory; and

one or more processors coupled to the non-transitory memory and configured to execute instructions to perform operations comprising:

obtaining, from a plurality of object detection sensors, status data sets associated with a plurality of geographical locations, the status data sets being automatically generated by the plurality of object detection sensors based on one or more determinations that an object optically or acoustically obstructs one or more object detection sensors;

determining, based on the status data sets, occupancy statuses of the plurality of geographical locations;

identifying a physical location of a user device based on location data provided by the user device;

automatically selecting a geographical location, from the plurality of geographical locations, based on the physical location of the user device; and

generating instruction data descriptive of one or more driving directions to the geographical location.

2. The system of claim 1, wherein the operations further comprise determining that the status data sets correspond to the plurality of geographical locations based on location data